

WHAT IS CLAIMED IS:

- 1 1. A writing instrument comprising a substantially tubular element extending between
2 a first end and a second end and designed to be held in a hand of a user, said tubular element
3 comprising:
4 a liquid reservoir;
5 a liquid spray system comprising a liquid spray head coupled to said liquid reservoir,
6 said spray head serving to spray liquid onto a medium from a distance; and
7 a processor unit serving to activate said liquid spray system to enable said spray
8 head to spray liquid onto the medium from a distance;
9 said tubular element further comprising:
10 measurement means coupled to said processor unit ; and
11 movement detector means coupled to said processor unit;
12 wherein:
13 said measurement means acts without physical contact between the writing
14 instrument and the medium to measure the distance between the spray head and the
15 medium;
16 said movement detector means detects movement of the spray head; and
17 said processor unit is adapted to cause said liquid spray system to be activated when
18 both said measurement means determine that the distance between said spray head and the
19 medium is less than a predetermined maximum value, and simultaneously said movement
20 detector means detect movement of said spray head.
- 1 2. An instrument according to claim 1, wherein said processor unit is adapted to cause
2 said liquid spray system to be activated when both said measurement means determine that
3 the distance between said spray head and the medium lies in the range defined by a
4 predetermined minimum value and said predetermined maximum value, and simultaneously
5 said movement detector means detect movement of said spray head.
- 1 3. An instrument according to claim 1, wherein said measurement means comprise an
2 optical system serving to measure the distance between said spray head and the medium.
- 1 4. An instrument according to claim 3, wherein:
2 said movement detector means are formed by said optical system and said processor
3 unit; and

4 said processor unit detects displacements of said spray head relative to the medium
5 as a function of the distances measured by said optical system.

1 5. An instrument according to claim 3, wherein said movement detector means
2 comprise an accelerometer.

1 6. An instrument according to claim 1, wherein said measurement means comprise an
2 ultrasonic acoustic probe serving to measure the distance between said spray head and the
3 medium.

1 7. An instrument according to claim 6, wherein:
2 said movement detector means are formed by said acoustic probe and said processor
3 unit; and
4 said processor unit detects displacements of said spray head relative to the medium
5 as a function of the distances measured by said acoustic probe.

1 8. An instrument according to claim 6, wherein said movement detector means
2 comprise an accelerometer.

1 9. An instrument according to claim 1, wherein said tubular element includes an
2 electrical power source and switch-on means connected to said electrical power source, said
3 switch-on means being actuatable by the user to switch on said liquid spray system, said
4 processor unit, and said measurement means and said movement detector means.

1 10. An instrument according to claim 1, wherein:
2 said tubular element includes means for emitting a visible light spot onto the
3 medium so as to represent the point of impact of the liquid spray on the medium.

1 11. An instrument according to claim 1, wherein:
2 said liquid spray head comprises at least one spray nozzle for spraying droplets of
3 liquid; and
4 said spray system further comprises an electrical signal generator for causing said at
5 least one nozzle of said spray head to be activated.

1 12. An instrument according to claim 11, wherein said tubular element has an outside
2 wall;
3 said selector means are mounted on said outside wall of said tubular element;
4 said selector means permits selection of the size of the droplets; and
5 said selector means is connected to said electrical signal generator of said spray
6 system to vary the frequency and/or the amplitude of electrical signals that cause said at
7 least one spray nozzle to be activated.

1 13. An instrument according to claim 1, wherein said processor unit is adapted to
2 activate communication means to emit a warning signal to the user when both said
3 measurement means detect that the distance between said spray head and the medium is less
4 than a predetermined maximum value, and simultaneously said movement detector means
5 have not detected any movement of the spray head over a predetermined time interval.

1 14. An instrument according to claim 1, wherein, when said liquid spray system has not
2 been activated for a first time interval, said processor unit is adapted to activate
3 communication means for a second time interval to emit a warning signal, and then to cause
4 said liquid spray system to be activated when said measurement means detect that the
5 distance between said spray head and the medium is once again less than the predetermined
6 maximum value, and simultaneously said movement detector means detect movement of
7 said spray head once again.

1 15. An instrument according to claim 1, wherein said movement detector means
2 comprise an accelerometer.